



PROMOTING STUDENT-TEACHERS' PRO-ENVIRONMENTAL BEHAVIOUR THROUGH ECOPEDAGOGY: AN EXPERIMENTAL STUDY

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ABSTRACT

The purpose of the present study is to examine how ecopedagogy promote the pro-environmental behaviour of pre-service D.El.Ed. student-teachers in Meghalaya. An experimental method was employed with a pre-test post-test control group design. 190 student-teachers constituted the sample of the study. Descriptive and inferential statistics were used for analysing the data. The finding revealed that rural student-teachers were having higher levels of pro-environmental behaviour which is also statistically significant as compared to urban counterparts. The result shows the existence of a significant difference in the effectiveness of ecopedagogy on pro-environmental behaviour of student-teachers of the experimental group. The study suggested the need for a model of teaching that rooted in ecopedagogy for promoting students' pro-environmental behaviour and consciousness.

KEYWORDS: Ecopedagogy, Pro-environmental behaviour, Student-teachers, District Institute of Education and Training, Diploma in Elementary Education.

1. INTRODUCTION:

Pro-environmental behaviour is a behaviour that consciously seeks to minimize the negative impact of one's action on the natural and a build world. It is a behavioural change that is affected by various factors such as motivation, socio-cultural practices, responsibility, priorities, education, incentives, etc. (Kolmuss & Agyeman 2010). Pro-environmental behaviours (PEB) are actions that people do in daily life that are comparatively better for the environment, (Science for Environment Policy, 2012).

Steg and Vlek (2009), defines Pro-environmental behaviour as behaviour that harms the environment as little as possible or even benefits the environment. According to Krajhanzl (2010), Pro-environmental behaviour is such behaviour that is generally judged in the context of the considered society as a protective way of environmental behaviour or a tribute to a healthy environment. It is a fact, that each person has his/her reasons why they behave the way they do. A person's behaviour to the environment is influenced by a wide range of influences or factors and education is one of them. (Krajhanzl, 2010). Education is one of the important factors that help to develop pro-environmental behaviour. It generates knowledge of issues, knowledge of action strategies, the locus of control, develops attitudes, verbal commitment and individual sense of responsibility to engage in environmentally responsible behaviour.

Ecopedagogy is the most effective tool for increasing the general level of environmental awareness, developing pro-environmental behaviour and skills for solving environmental problems, maintaining and improving the quality of life and the environment (Practice Freedom, 2013). Ecopedagogy is an approach to education that has emerged from critical pedagogy. It is a response to the planetary environmental crisis which is a result of the collective responsibility of humanity (Verret, 2012). It seeks the possibility of the creation of a new ecologically sustainable civilization and sees it in the fundamental, democratic and planetary reconstruction of the educational system (Grigorov & Fleuri, 2012). Ecopedagogy seeks to make citizens of the earth endowed with the ability to reasonably take action for all life. It can empower learners to internalise pre-requisite dialogue attributes to care for the mother earth sustainably, eco-literate and providing the ability to know and understand the environment (K'Odhiambo, 2017).

According to Napitupulu and Munandar (2017), ecopedagogy is a way to connect to nature to critically examine environmental problems. It takes into account people, cultures and lifestyle, and it respects identity and diversity. It enables individuals to develop skills and strategies to foster responsible environmental action along with encouraging individuals to live a more sustainable lifestyle. It provides students with the process of inquiry and an opportunity to critically examine an environmental problem and devise solutions. Ecopedagogy poses environmental problems and teaches students how to cope with them through action, creativeness and dialogue, how to create a more just, sane and sustainable civilization instead of just to adapt to the world. It cultivates in students critical thinking, consciousness-raising, the culture of dialogue and active democratic participation in society; promotes new crucial eco-literacies and socially responsible lifestyles, educates critically students for taking action for sustainability and social justice in local and global society (BCSLDE, 2020).

2. NEED AND JUSTIFICATION OF THE STUDY:

Environmental problem is one of the problems affecting the state of Meghalaya. These environmental problems that we are experiencing today are the consequences of poor environmental behaviour, low environmental awareness, indifferent attitude and anti-environmental behaviour of the public in the state. To overcome this problem, there is a need through education to promote positive environmental behaviour, sound environmental practices and taking action towards the health of the environment.

Ecopedagogy as an educational approach, will promote positive environmental behaviour and increase student teachers' critical environmental awareness. It can also increase environmental literacy, foster and encourage responsible citizenship, develop and teach personal and civic responsibilities and foster pro-environmental behaviour which generally helps to prepare students for adopting sustainable lifestyles. It is an answer to prevent a continuation or to worsen the recent environmental problems we encounter today. The teacher education programme is therefore very crucial for the development of environmental friendly teachers and the development of pro-environmental behaviour among teachers. The investigator is developing an educational module based on ecopedagogy for students teachers of DIETs, and then measure its effect on pro-environmental behaviour among student teachers of DIETs, Meghalaya.

3. OBJECTIVES OF THE STUDY:

1. To find out the level of pro-environmental behaviour of rural and urban student-teachers.
2. To find out the difference in the level of pro-environmental behaviour between rural and urban student-teachers
3. To find out the effect of ecopedagogy and conventional methods on pro-environmental behaviour of rural and urban student-teachers.

4. HYPOTHESES OF THE STUDY:

1. There is no significant difference in the level of pro-environmental behaviour between rural and urban student teachers.
2. There is no significant difference in the effect of ecopedagogy on pro-environmental behaviour of urban student-teachers of the experimental group before and after exposure to the treatment.
3. There is no significant difference in the effect of ecopedagogy on pro-environmental behaviour of rural student-teachers of the experimental group before and after exposure to the treatment.
4. There is no significant difference in the mean scores on pro-environmental behaviour between urban and rural student-teachers of the experimental group after exposure to the treatment (ecopedagogy).
5. There is no significant difference in the effect of the conventional method on the pro-environmental behaviour of urban student-teachers of the controlled group before and after exposure to the treatment.

6. There is no significant difference in the effect of the conventional method on the pro-environmental behaviour of rural student-teachers of the controlled group before and after exposure to the treatment.

5. METHODOLOGY:

In the present study, an experimental method was employed with a Pre-test Post-test Control Group design. Before assigning the participants to the experimental group and the controlled group, the pair matching technique was adopted to control the effect of the intervening variable i.e., environmental awareness possessed by student-teachers. The sample was matched on environmental awareness scores by adopting the lottery method. In the process, 95 student-teachers assigned to the experimental group were exposed to ecopedagogy and another 95 student-teachers assigned to the controlled group were exposed to the conventional method. The sample for the experimental study comprised of 190 first-year student-teachers taken from the three DIETs (Thadlaskein, Sohra, Tura). Statistical technique such as frequency, percentage, mean, standard deviation and t-test were used for analysing the data. The following self-constructed tools were used for the study. 1. Pro-Environmental Behaviour Scale 2. Environmental Awareness Test and 3. Ecopedagogy module.

6. RESULT AND DISCUSSION:

i. Level of Pro-Environmental Behaviour of Rural and Urban student-teachers before the exposure to the treatment.

Table 1: Level of PEB of Rural and Urban Student-Teachers

Raw Score range	Range of Z-Score	Rural		Urban		Levels of Pro-Environmental Behaviour
		N	%	N	%	
290 and Above	+2.01 and above					Extremely Favourable
273-289	+1.26 to +2.00	3	2.01			High Favourable
256-272	+0.51 to +1.25	10	6.71	5	12.19	Above Average
233-255	-0.50 to +0.50	84	56.38	15	36.58	Moderate / Average
215-232	-0.51 to -1.25	40	26.85	16	39.02	Below Average
198-214	-1.26 to -2.00	10	6.71	2	4.89	Unfavourable
197 and Below	-2.01 and below	2	1.34	3	7.32	Extremely Unfavourable
Total		149	100	41	100	

Interpretation: The study showed that the majority (56.38%) of the rural student-teachers have been categorized under the average level of Pro-Environmental Behaviour (PEB) followed by 26.85% below-average level, 6.71% unfavourable level of PEB respectively, 2.01% of rural student-teachers were categorized under the high favourable level of PEB and 1.34% were at the extremely unfavourable level of Pro-Environmental Behaviour (PEB). It was also found that the majority (39.02%) of urban student-teachers have been placed in the below-average level of Pro-Environmental Behaviour (PEB) followed by 36.58% average level, 12.19% above-average level, 7.32% extremely unfavourable level of PEB, and 4.89% were at the unfavourable level of PEB respectively. Overall, the finding showed that urban student-teachers possess a higher level of PEB.

Discussion: The result is similar to the findings reported by Shafiei and Maleksaeidi (2020); Ramos et al., (2020); Sivamoorthy (2015); Behera and Samal (2015); Manikandan (2015); and Raju (2007) which demonstrates that rural residents were having a higher level of PEB as compare to the urban counterparts. The result of the present study supports the same observations which show that rural student-teachers of DIET, Meghalaya are having a higher level of pro-environment behaviour as compared to their urban counterparts. The reasons account for this effect may be attributed to the fact that rural student-teachers are more eco-friendly, spend more time in nature, hold a stronger sense of connection to nature and behave in a more pro-environmental way than urban counterparts.

ii. The difference in the Level of Pro-Environmental Behaviour (PEB) between rural and urban student-teachers

Table 2: Difference in the Level of PEB between rural and urban student-teachers

Variable	Locale	n	Mean	SD	df	t-value	p
Pro-Environmental Behaviour	Rural	149	234.69	13.77	188	2.67	0.01*
	Urban	41	227.07	16.19			

*Significant at 0.01 level

$t(188) = 2.62$ and $p = 0.01$

Interpretation: An independent samples t-test was performed to investigate the significant difference between urban and rural student-teachers in Pro-Environmental Behaviour. Table 12, showed that the t-value was 2.67 which was significant at 0.01 level with $df = 188$. Hence the hypothesis that there is no significant difference in the level of Pro-Environmental Behaviour (PEB) between rural and urban student teachers is rejected. Based on this result, it can be interpreted that there was a significant difference in the level of Pro-Environmental Behaviour between urban and rural student-teachers of DIETs, Meghalaya. The mean difference of 7.62 was in favour of rural student-teachers. This indicates that rural student-teachers have a higher level of Pro-Environmental Behaviour as compared to urban student-teachers

Discussion: The result shows that rural student-teachers have a higher level of Pro-Environmental Behaviour as compared to urban student-teachers. It explains behaviour such as connecting to the environment, conservation behaviour, appreciating and protecting the environment and social concern was higher among rural student-teachers of DIETs, Meghalaya as compared to urban student-teachers. Contrary to the finding of Samal (2013); and Kumari (2010), this finding falls in line with previous findings of Alcock et al., (2020); Behera and Samal (2015); Manikandan (2015); Raju (2007); and Budak et al., which demonstrates that rural residents statistically possess a significantly different level of PEB as compare to urban residents.

iii. The difference in the Effectiveness of Ecopedagogy on Pro-Environmental Behaviour based on locale.

To investigate the null hypotheses 2, 3 and 4, a one-tailed t-test was performed as an improvement after the completion of the intervention programme was expected. Table 3 shows the computation of the t-test and mean score difference in the overall PEB scores of the student-teachers before and after the programme. The results of the same are given below:

Table 3: Difference in the effect of ecopedagogy on Pro-Environmental Behaviour (PEB) between urban and rural student-teachers in the Experimental group

Part	Locale	n	Scores	Mean	SD	df	t-value	p
1	Urban	15	Pre-test	226.4	17.48	28	7.44	0.02*
		15	Post-test	273.5	17.17			
2	Rural	80	Pre-test	234.23	13.95	158	15.37	0.02*
		80	Post-test	273.5	18.09			
3	Urban	15	Post-test	273.5	17.17	93	0.007	0.01**
		80	Post-test	273.5	18.09			

*Significant at 0.02 level

**Not significant at 0.01 level

$t_U(28) = 7.44$ and $p = 0.02$, $t_R(158) = 15.37$ and $p = 0.02$, $t_{U\&R}(93) = 0.007$ and $p = 0.02$.

Interpretation: Table 3 under part 1, displayed the t-value to be 7.44 which was significant at 0.02 level with $df = 28$. Thus, the null hypothesis was not accepted. Based on the outcome of this result, it can be interpreted that there was a significant difference in the effect of ecopedagogy on the Pro-Environmental Behaviour of urban student-teachers of the experimental group after exposure to the treatment. The mean difference of 47.1 was in favour of a post-test score. This indicates that ecopedagogy was effective in promoting pro-environmental behaviour of urban student-teachers of DIETs,

Meghalaya who were in the experimental group.

Table 3 under part 2, revealed the t-value to be 15.37 which was significant at 0.02 level with $df = 158$. Thus, the null hypothesis was not accepted. So statistically, this result can be interpreted that there was a significant difference in the effect of ecopedagogy on the Pro-Environmental Behaviour of rural student-teachers of the experimental group after exposure to the treatment. The mean difference of 39.27 was in favour of a post-test score. This highlight that ecopedagogy was effective in enhancing the pro-environmental behaviour of rural student-teachers of DIETs,

Meghalaya who were in the experimental group.

Table 3 under part 3, showed that the t-value is 0.007 which was not significant at 0.01 level with $df = 93$. Thus, the null hypothesis was not rejected. Based on this result, it can be interpreted that there was no significant difference in the gain scores of urban and rural student-teachers in pro-environmental behaviour leading to the acceptance of the null hypothesis. It shows that both urban and rural student-teachers have equally benefitted from the treatment (ecopedagogy). This explains that ecopedagogy is equally effective for both urban and rural student-teachers of DIETs, Meghalaya.

iv. The difference in the Effectiveness of Conventional methods on Pro-

Environmental Behaviour based on locale.

To test the null hypotheses 5 and 6, a one-tailed t-test was used as an improvement after the completion of the intervention programme was expected. Table 4 shows the computation of the t-test and mean score difference in the overall PEB scores of the student-teachers before and after the programme. The results of the same are given below:

Table 4: Difference in the effect of conventional method on Pro-Environmental Behaviour (PEB) between urban and rural student-teachers of the Controlled group.

Part	Locale	n	Scores	Mean	SD	df	t-value	p
1	Urban	26	Pre-test	229.53	15.21	50	0.89	0.02*
		26	Post-test	233.34	14.94			
2	Rural	69	Pre-test	234.71	14.09	136	1.65	0.02*
		69	Post-test	238.62	14.32			

*Not significant at 0.02 level

$t_{(50)} = 0.89$ and $p = 0.02$, $t_{(136)} = 1.65$ and $p = 0.02$.

Interpretation: Table 4 under part 1, displayed the t-value to be 0.89 which was not significant at 0.02 level with $df = 50$. Thus, the null hypothesis was accepted. Based on this result, it can be interpreted that there was no significant difference in the effect of the conventional method on the Pro-Environmental Behaviour of urban student-teachers of the controlled group after exposure to the treatment. This implies that the conventional method was ineffective in promoting pro-environmental behaviour of urban student-teachers of DIETs, Meghalaya who were in the controlled group.

Table 4 under part 2, revealed the t-value to be 1.65 which was not significant at 0.02 level with $df = 136$. Thus, the null hypothesis was accepted. Based on the outcome of this result, it can be interpreted that there was no significant difference in the effect of the conventional method on the Pro-Environmental Behaviour of rural student-teachers of the controlled group after exposure to the treatment. This signifies that the conventional method was ineffective in enhancing the pro-environmental behaviour of rural student-teachers of DIETs, Meghalaya who were in the controlled group.

Discussion: The pattern of results of the present study is consistent with the previous literature of Goyal (2017); Erdogan (2015); Alexander (2012); Jindal (2010); Schneller (2008); Yung, Huang and Kawata (2002); Goswami and Pirta (2002); which shows that students of the experimental group responded positively to the intervention programme and post-test result indicated a significant effect in developing and facilitating responsible environmental behaviour among the students. The findings of the study also show that ecopedagogy, statistically improve and facilitate positive environmental behaviour of the student-teachers of the experimental group. The results are in line with the findings of the previous studies of Napitupulu and Munandar (2017); Berberoglu (2015); Surata, Jayanti and Lansing (2015); Eryaman et al., (2010); Jackson (1999); which indicates that ecopedagogy influences and improves the environmental behaviour of students and teachers. The finding implies that ecopedagogy is an effective approach in bringing changes in the behaviour of student-teachers of DIETs, Meghalaya towards the conservation of biodiversities like animals, plants, wildlife and medicinal plants; conservation of forest resources, tree plantation; practising waste reduction measures, reducing pollution of water and air and displaying concern towards a social cause like home violence and child labour. Other studies conducted by Alexander (2012); Okur-Berberoglu and Uygun (2013); Bajd and Lescanec (2011); shows that the conventional method had no significant effect on the environmental behaviour of the student. These findings are in agreement with the present study which indicates that the conventional method had no significant effect on the behaviour of the student-teachers of the controlled group.

7. RECOMMENDATIONS:

1. It is recommended that programme such as nature visit, field trip, project work related to natural and socio-cultural issues are to be part of the D.El Ed programme so that contact with nature can be a way of promoting student-teachers' pro-environmental behaviour.
2. Practical-based approach is to be integrated into the teacher training programme and for deliberation of various topics from the natural and socio-cultural environment so that student-teachers are provided with an opportunity to discuss, analyse and study these issues in a more comprehensive and in-depth manner.
3. Teacher educators should implement an ecopedagogy approach in the teaching-learning process where a combination of strategies like dialogue, participatory, case-study, field study, group discussion, role-play, brainstorming, critical reflection, contextualisation, documentation, creative writing, debate, seminar (based on their applicability and suitability) can be integrated to improve the pro-environmental behaviour in the student-teachers.

8. CONCLUSION:

In conclusion, it can be said that the present study shed some light on the effectiveness of the ecopedagogy approach in facilitating positive environmental behaviour of rural and urban student-teachers of DIETs, Meghalaya. The findings have shown that there has been a significant improvement in the pro-environmental behaviour of rural and urban student-teachers from the experimental group as a result of their exposure to the ecopedagogy approach with biodiversity conservation, forest conservation, waste management reduction, environmental pollution and socio-cultural issues such as domestic violence and child labour. The implementation and integration of this approach in the teaching-learning process will further facilitate and enhance students' pro-environmental behaviour and consciousness for sustainable development.

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